

Session VIII

Neurodegenerative Mechanisms: Clinical and Experimental

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**COMMON PATHOPHYSIOLOGICAL MECHANISMS OF
CHRONIC NEUROLOGICAL DISEASES DEMENTIA,
PARKINSON, EPILEPSY, STROKE & SCHIZOPHRENIA**
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Now what is the insult at the neuropathological level? Neurons have just a few ways to respond to insults. The brain is divided into anatomical and functional regions and units. Most of the neuronal functions are linked to different types of neurotransmitters, enzymes and receptors. The response of a given group of neurons is not specific for neurotransmitters but is highly specific for neuronal receptors. Nitric acid, a newly discovered substance, acts as a neurotransmitter or an excitatory messenger and has an outstanding action on the central nervous system and in the peripheral nervous system. Over recent years the role of excitatory neurotransmitters has become increasingly important in health and disease. Glutamic acid, kainic acid and the receptors NMDA, AMPA and nitric acid reactions are becoming more important as their role becomes more evident in health and diseases. The healthy neuronal function is basically the result of a proper balance between the systems, neurotransmitters and receptors outlined above. Concepts about enzyme systems are also important in order to understand the different models that are being proposed for these common mechanisms involved in the neurophysiology and neuropathology of stroke, dementia, epilepsy, schizophrenia Parkinson and major depression. Enzymes that will play a role could be mentioned: MAO A & B with its inhibitors playing a role in depression and Parkinson's diseases respectively with dopamine being modified by IMAO type B with the treatment and production of Parkinson's syndrome whereas IMAO type A selectively affects serotonin and therefore modifies depressive states. The metabolism of calcium will also be a common background interacting with the pathological states and its combination with nitric acid metabolism will be important in the genesis of dementia, stroke (cerebrovascular disease) occlusive type and epilepsy. Schizophrenia and Parkinson's are linked together by the neurotransmitter dopamine and its subtype of receptors affecting D1 and D2 in Parkinson's and D3 and D4 in schizophrenia and psychosis. The basic interrelations of all of these entities will be discussed.